

Claims:

1. A method for expressing a target gene in a cell within a host organism which comprises introducing into the organism cells containing:

(a) a transcription factor construct containing a first heterologous DNA sequence encoding and capable of expressing a transcription factor capable of activating transcription of a gene linked to a transcription control sequence responsive to the transcription factor, and

(b) a target gene construct containing a second heterologous DNA sequence comprising a target gene operably linked to a transcription control sequence comprising a DNA promoter sequence and one or more copies of a DNA recognition sequence permitting gene transcription responsive to the presence of the transcription factor.

2. A method of claim 1 in which the cell is of human origin.

3. A method of claim 1 in which the host organism is a human.

4. A method of claim 1 in which the transcription factor comprises one or more domains having a peptide sequence derived from a naturally occurring human peptide sequence.

5. A method of claim 1 in which the transcription factor comprises peptide sequence derived from a DNA-binding protein of human origin.

6. A method of claim 1 in which the transcription factor comprises a composite DNA-binding domain.

7. A method of claim 1 in which the transcription factor comprises peptide sequence derived from a transcription activating protein of human origin.

8. A method of claim 7 in which the transcription factor contains one or more copies of peptide sequence comprising all or part of the peptide sequence spanning positions 361 through 550 of human NF-kB p65, or a peptide sequence derived therefrom.

9. A method of claim 7 or 8 in which the transcription factor contains one or more copies of peptide sequence comprising all or part of the peptide sequence spanning positions 361 through 450 of human NF-kB p65, or a peptide sequence derived therefrom.

10. A method of claim 9 in which the transcription factor contains one or more copies of the peptide sequence p65(361-550), or peptide sequence derived therefrom.

11. A method of claim 8 in which the transcription factor comprises a composite transcription activation domain.

12. A method of claim 11 in which the composite transcription activation domain comprises:

(a) one or more copies of a peptide sequence comprising all or a portion of the peptide sequence spanning positions 361-450 of human NF-kB p65, or peptide sequence derived therefrom, and

(b) one or more copies of a heterologous peptide sequence which potentiates the transcription activation potency of the transcription factor

13. A method of claim 12 in which the heterologous peptide sequence is selected or derived from peptide sequence within the sequence of VP16 V8, VP16 C, HSF, or CTF.

14. A method of claim 1 in which the DNA sequence encoding the transcription factor and the DNA sequence encoding the target gene are both operably linked to transcription control sequences permitting gene expression responsive to the presence of the transcription factor.

15. A method of claim 1 in which the DNAs are introduced into the cell by calcium phosphate precipitation, DEAE dextran-DNA complexation, fusion, electroporation, biolistics, transfection, or lipofection.

16. A method of claim 15 in which the DNAs are present in one or more viral vectors.

17. A method of claim 1 in which the cells are encapsulated within a semipermeable membrane.

18. A method for expressing a target gene in a cell within a host organism which comprises introducing into the organism, under conditions permitting DNA uptake by one or more cells within the organism:

(a) a transcription factor construct containing a first heterologous DNA sequence encoding and capable of expressing a transcription factor capable of activating transcription of a gene linked to a transcription control sequence responsive to the transcription factor, and

(b) a target gene construct containing a second heterologous DNA sequence comprising a target gene operably linked to a transcription control sequence comprising a DNA promoter sequence and one or more copies of a DNA recognition sequence permitting gene transcription responsive to the presence of the transcription factor.

19. A method of claim 18 in which the host organism is mammalian.

20. A method of claim 19 in which the host organism is a human subject.

21. A method of claim 20 in which the transcription factor comprises one or more domains having a peptide sequence derived from a naturally occurring human peptide sequence.

22. A method of claim 20 in which the transcription factor comprises peptide sequence derived from a DNA-binding protein of human origin.

23. A method of claim 20 in which the transcription factor comprises a composite DNA-binding domain.

24. A method of claim 20 in which the transcription factor comprises peptide sequence derived from a transcription activating protein of human origin.

25. A method of claim 24 in which the transcription factor contains one or more copies of peptide sequence comprising all or part of the peptide sequence spanning positions 361 through 550 of human NF-kB p65, or a peptide sequence derived therefrom.

26. A method of claim 25 in which the transcription factor contains one or more copies of peptide sequence comprising all or part of the peptide sequence spanning positions 361 through 450 of human NF-kB p65, or a peptide sequence derived therefrom.

27. A method of claim 26 in which the transcription factor contains one or more copies of the peptide sequence p65(361-550), or peptide sequence derived therefrom.

28. A method of claim 25 in which the transcription factor comprises a composite transcription activation domain.

29. A method of claim 28 in which the composite transcription activation domain comprises:

(a) one or more copies of a peptide sequence comprising all or a portion of the peptide sequence spanning positions 361-450 of human NF-kB p65, or peptide sequence derived therefrom, and

(b) one or more copies of a heterologous peptide sequence which potentiates the transcription activation potency of the transcription factor

30. A method of claim 29 in which the heterologous peptide sequence is selected or derived from peptide sequence within the sequence of VP16 V8, VP16 C, HSF, or CTF.

31. A method of claim 20 in which the DNA sequence encoding the transcription factor and the DNA sequence encoding the target gene are both operably linked to transcription control sequences permitting gene expression responsive to the presence of the transcription factor.

32. A method of claim 20 in which the two DNA constructs are present in one or more viral vectors.

33. A recombinant DNA sequence encoding a chimeric transcription factor containing one or more copies of peptide sequence comprising all or part of the peptide sequence spanning positions 361 through 550 of human NF-kB p65, or a peptide sequence derived therefrom, and peptide sequence heterologous thereto.

# Index

5

10

37. A cell containing a recombinant DNA sequence of any of claims 33 through 36.